Table F3-1. Cost Summary for Sediment Remedial Alternatives.

					Mech	Hydraulic											
			Water		Dredge &	Dredge &	Sediment							Planning &			
	Dredge	Sediment	Volume		Sediment	Sediment	Transport &	Thermal	Subaqueous		Water	Misc (H&S	Post	Engineering	Oversight	Contingency	
Alternative	Volume (cy) <sup>1</sup>	Weight (t) <sup>2</sup>	(Mgal)	Mob/Demob	Handling	Handling	Disposal	Treatment	Сар	CDF	Treatment	Mitigation)	Construction <sup>3</sup>	@ 15%	@ 15%	@ 20% <sup>4</sup>	Total
SED-2	70,663	38,589	\$17	\$1,151,155	\$5,096,964					\$14,400,902	\$1,905,801	\$1,619,440	\$715,090	\$3,626,140	\$3,626,140	\$4,834,853	\$36,976,485
SED-3A	77,822	33,999	8	\$932,593	\$11,665,778		\$2,702,164		\$2,451,400		\$1,713,075	\$119,440	\$715,090	\$2,937,667	\$2,937,667	\$3,916,890	\$30,091,764
SED-3B	77,822	33,999	8	\$1,071,909	\$10,173,234		\$1,750,243	\$5,230,796	\$2,451,400		\$1,713,075	\$119,440	\$715,090	\$3,376,514	\$3,376,514	\$4,502,019	\$34,480,234
SED-3C	77,822	33,999	70	\$1,132,426		\$11,078,571	\$2,692,814		\$2,560,515		\$6,197,188	\$119,440	\$715,090	\$3,567,143	\$3,567,143	\$4,756,191	\$36,386,521
SED-3D	77,822	33,999	70	\$1,301,571		\$10,227,634	\$1,750,243	\$5,230,796	\$2,506,115		\$6,197,188	\$119,440	\$715,090	\$4,099,948	\$4,099,948	\$5,466,597	\$41,714,569
SED-4A	133,906	58,500	13	\$1,287,762	\$18,595,427		\$4,634,149				\$2,296,786	\$228,880	\$715,090	\$4,056,451	\$4,056,451	\$5,408,601	\$41,279,596
SED-4B	133,906	58,500	13	\$1,528,250	\$16,025,908		\$3,011,581	\$9,001,843			\$2,296,786	\$228,880	\$715,090	\$4,813,987	\$4,813,987	\$6,418,650	\$48,854,962
SED-4C	133,906	58,500	121	\$1,615,830		\$17,584,105	\$4,436,108				\$10,067,515	\$228,880	\$715,090	\$5,089,866	\$5,089,866	\$6,786,488	\$51,613,748
SED-4D	133,906	58,500	121	\$1,916,784		\$16,025,908	\$3,011,581	\$9,001,792			\$10,067,515	\$228,880	\$715,090	\$6,037,869	\$6,037,869	\$8,050,492	\$61,093,779
SED-5A	133,906	58,500	180	\$2,054,744	\$27,570,933		\$4,984,160				\$7,817,986	\$721,800	\$715,090	\$6,472,443	\$6,472,443	\$10,787,406	\$67,597,005
SED-5B	133,906	58,500	180	\$2,497,981	\$29,056,761		\$3,361,280	\$9,001,800			\$7,817,986	\$721,800	\$715,090	\$7,868,641	\$7,868,641	\$13,114,402	\$82,024,383

<sup>1:</sup> Includes Wood 2: Without Wood

<sup>3:</sup> Present Value at 7% Discount Factor
4: A 25% contingency was applied to Alternatives 5A and 5B.

Estimate of 8.8 acres based upon GIS

Based upon GIS Estimate

338,091 sq ft

70,663 cv

Total Area:

Total Sediment Volume:

Total Volume of Wood Waste: 100 cy Estimate of wood derived from side scan sonar Total Sediment Weight: 38,589 tons Based on 65% moisture for disposal Total Volume of Water: 17 Mgal Water volume estimate based on displacing the same volume of water as the sediment volume plus 20% Mob/Demob <u>Unit</u> Quanitity Unit Cost Moh/Demob \$1,151,155 Estimate at 5% of total costs except without engineering, contingency and LT monitoring ls \$1,151,155 Construct CDF Item No. <u>Unit</u> Quanitity **Unit Cost** Item Total Notes 1 Move/Abandon Existing Utilities \$100,000 \$100,000 Includes installation of electric upon completion (\$40k) & move/abandon existing utilities (\$60k) ls 2 24 hr. Security of Site weekly 76 \$2,695 \$204,820 \$15/hr X 24 hr X 7 days + \$25/day (expenses) 3 Perimeter Fence 2528 \$20 \$50,560 Fence along land side 4 Pre-Trenching Activities day 17 \$2.826 \$48,042 Pre-trench along landside to 10 ft. Assume 150 ft/day 5 Dispose of debris \$1,500 \$3,000 Dispose of debris in a 20 cy. roll off box ea \$21.840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore 6 Install HC Boom ft 5460 \$4 7 HC Boom Debris Disposal Labor \$3,000 ea 2 \$6,000 Remove debris twice during sheetpile wall construction using a barge 8 Debris Disposal \$1,500 \$3,000 Dispose of debris in 20 cy. roll off box 9 Move HC Boom ft 5460 \$1 \$5,460 Move HC Boom after sheetpile installation (1/4 cost of installation) 10 HC Boom Removal 5460 \$4 \$21,840 Removal of HC Boom into roll off box ft \$1,500 \$3,000 Dispose of HC Boom in two 20 cy. roll off boxes 11 Dispose of Boom ea 2 12 Drive Sheetpile Along Railroad 28050 \$1 357 620 Depth approx 25 ft \$48 sa ft 13 Drive Sheetpile Along Ellis Ave sq ft 22378 \$48 \$1,083,071 Depth tapers from 25-40 ft from railroad to lakeside 14 Drive Sheetpile Along Prentice Ave 24068 \$48 \$1,164,867 Depth tapers from 25-40 ft from railroad to lakeside sq ft 15 Drive Sheetpile in Water 56925 \$54 \$3,073,950 Single sheetpile wall. Depth approx 45 ft sq ft 16 Demolition and Disposal Existing WWTP 41935 \$5 \$209.675 Cost to demolish structure and dispose debris at landfill, does not include disposal of hazardous materials i.e. asbestos sa ft 17 Construct Sediment Holding Ponds су 21258 \$20 \$425,165 Surface ponds 10 ft. high, 2H:1V side slopes, 595' X 200', 2 ft clay liner, 2 ft freeboard (contingent on type of dredging) \$7.781.910 Subtotal Total Volume of Clay Material: 21,258 cy, Total Volume Holding Pond: 22,170 cy Mechanical Dredging Unit Cost Item No. Quanitity Unit Total Notes \$112.500 Pre. mid. post Survey Item 1 Bathymetric Survey (pre, mid, post) \$37,500 ea 3 2 HC Boom Debris Disposal Labor ea 2 \$3,000 \$6,000 Remove debris twice during dredging using a barge 3 Debris Disposal \$1,500 \$3,000 Dispose of debris in 20 cy. roll off box 5 Dredge Sediments 70663 \$30 \$2,119,890 Dredge >10 ppm volume based on Minneapolis calculations in separate spreadsheet су 6 Air Emissions Monitoring \$8,725 \$392,625 Monitor air quality during construction of CDF, dredging and CDF capping based on 5 stations 3 times/week using NIOSH methods weeks 45 7 Water Quality Monitoring \$342,000 Daily turbidity, and TSS and PAHs monitoring weekly through dredging and dike construction activities weeks 38 \$9,000 8 Installation of Rock Buttress \$1,993,600 Install rock buttress during dredging activities for CDF stabilization. (26581 cy rocks X 1.5) =39,872 tons tons 39872 \$50 \$18 \$127,349 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area. 9 Benthic habitat/thin layer CV 7075 Subtotal \$5,096,964 Water Treatment Item No. Unit Quanitity **Unit Cost** 1 Sand Filter Capital Cost ea \$385,000 \$385,000 Stryker Bay cost estimates were used for this estimate. Sand filters are 2 Oil Water Separator ea \$25,000 \$50,000 dual media with 250 gpm design flow rate with auto backwashing 2 3 Oil Water Separator O&M Mgal 17 \$2,700 \$46,238 controls based on vendor quotes. The carbon system would be two 4 Carbon Filtration 17 \$67,000 \$1,147,396 10,000 lb beds with manual piping controls and includes the estimated Mgal 5 Water Quality Testing \$2,400 \$41,101 carbon consumption to average out to \$0,067/gallon cost based on iar 17 Mgal 6 O&M day 98 \$2,400 \$236,066 tests on sediments of Stryker Bay. Subtotal \$1,905,801 **CDF Capping** Item No. Item Unit Quanitity Unit Cost \$2 \$1,546,304  $\overline{40}$  mil HDPE from shoreline to sheetpile (cost is based on other bids and experience, \$1 for material and \$1 to install/sq ft) 2 Geomembrane 773152 sq ft 3 Geocomposite sq ft 773152 \$2 \$1,546,304 Geotextile/geonet composite drainage layer from shoreline to sheetpile, cost based on bids \$1 material and \$1 to install/ sq ft. 4 Sand and clay cap over CDF 50088 \$22 \$1,101,926 1.5 ft. sand plus 2 ft of clay cover under geomembrane from shoreline to sheetpile CV 5 Top Soil over CDF 6261 \$18 \$112,697 0.5 ft. topsoil cover over sand layer from shoreline to sheetpile CV 6 Vegetation \$3.500 \$27,165 Seeding from shoreline to sheetpile 7.8 acre 7 Asphalt \$843,333 Area to be paved (6 inches stone, 3 inches binder, 2 inches surface) over current park along Marina Drive sq. yd. 33733 \$25 8 Clay Cover over land 32233 \$22 \$709,137 2 ft. clay cover from shoreline to sheet walls inc. Marina Drive (pavement) су 9 Local soil over entire area 57271 \$10 \$572,705 2ft of local soils over clay and membrane cap су \$18 10 Top Soil over land 2436 \$43,851 0.5 ft. topsoil cover over sand layer from shoreline to Marina Drive (pavement) CV \$10,570 Seeding from shoreline to sheet pile s except Marina Drive (pavement) to 11 Vegetation on land \$3.500 acre 3.02 \$105,000 For water runoff during storm post-remediation (1300 ft X 2 + 500ft + 4 Catch Basins) = 2600+500=3100 X \$30/sq ft + (4 X 3000) = \$105,000 12 Stormwater Drainage System ls \$105,000 Subtotal \$6,618,992

## Misc

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total	Notes
1 Develo	p HASP	Is	1	\$10,000	\$10,000	\$100/hr X 40 hr/wk X 2.5 weeks
2 Health	& Safety Personnel	weeks	76	\$1,440	\$109,440	Once a week, for 2 years (38 weeks/yr)
3 Wetlan	d Mitigation	Is	1	\$1,500,000	\$1,500,000	
				Subtotal	\$1,619,440	
				Total	\$24,174,264	l .
			E	Ingineering @ 15%:	\$3,626,140	1
				Oversight @ 15%:	\$3,626,140	1
				Subtotal	\$31,426,543	<b>;</b>
			(	Contingency @ 20%	\$4,834,853	Only taken on Capital Costs not Engineering
				TOTAL	\$36,261,395	

## Post Construction

Item No.	<u>Item</u>	Unit	Quanitity	Unit Costs	<u>Total</u>	Notes
1 Monitori	ng	yr	30	\$40,000	\$1,200,000	Monitor locations with <20 ppm for length determined by US EPA
2 Reportir	ng	yr	30	\$12,000	\$360,000	Post-Closure Reporting
3 O&M		yr	30	\$10,000	\$300,000	Based on contractor estimates
			Subtotal	\$62,000	\$1,860,000	
Present	worth @ 7% discount factor				\$715.090	

### GRAND TOTAL \$36,976,485

		Со	st + Oversight	_	
Summary (Capital Costs)	Cost	&	Engineering	Co	ntingency
Mob/demob & Misc	\$ 2,770,595	\$	3,601,774	\$	554,119
Construct CDF	\$ 7,781,910	\$	10,116,483	\$	1,556,382
Dredge	\$ 5,096,964	\$	6,626,054	\$	1,019,393
Water Treatment	\$ 1,905,801	\$	2,477,541	\$	381,160
Complete CDF	\$ 6,618,992	\$	8,604,690	\$	1,323,798
Total Estimated Cost	\$ 24,174,264	\$	31,426,543	\$	4,834,853

Total Capital Cost With Contingency \$ 36,261,395

Total Area:

Total Sediment Volume:

Total Volume of Wood Waste: Total Sediment Weight: 696,960 sq ft

77.822 cv

15,564 cy

33,999 tons

TOTAL:

\$29.376.674

Based upon GIS calculations

Based upon GIS calculations

Assume large wood waste is 20% of total sediments

Weight estimate based on SG = 2.6 dry weight, 65% solids for disposal

Total Volume of Water: 7.79 Mgal Water volume estimate based on 46% solid content by volume and dewatered to 65% solids plus 20% additional water Mob/Demob Unit Quanitity **Unit Cost** Mob/Demob ls \$932,593 \$932,593 Estimate at 5% of total costs except without engineering, contingency and LT monitoring Mechanical Dredging & Sediment Treatment Unit Quanitity **Unit Cost** Item No. Total Notes 1 Move/Abandon Existing Utilities \$100,000 \$100,000 \$121,275 \$15/hr X 24 hr X 7 days + \$25/day (expenses) 2 24 hr. Security of Site weekly 45 \$2 695 3 Perimeter Fence In ft 2528 \$20 \$50,560 Fence along land side \$112,500 Pre- and Post Dredge and post cap - Bathymetric Survey 4 Survey ea \$37.500 5 Install Sheet pile outside dredge area 45000 \$2,160,000 Install sheet pile wall instead of silt curtains sa ft \$48 6 Install HC Boom 5460 \$21,840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore 7 HC Boom Debris Disposal Labor \$3,000 \$6,000 Remove debris twice during dredging using a barge 8 Debris Disposal \$1,500 \$3,000 Dispose of debris in 20 cy. roll off box 9 HC Boom Removal 5460 \$4 \$21,840 Removal of HC Boom into roll off box \$3,000 Dispose of HC Boom in two 20 cy. roll off boxes 10 Dispose of Boom ea 2 \$1.500 11 Large Wood Waste Removal \$700,398 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cv 15564 су \$45 \$1,167,330 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (15,564 cy)/20 cy/box 12 Large Wood Waste Disposal 778 \$1,500 ea 13 Mechanically Dredge Sediment \$1,867,728 Mechanically dredge sediments with a concentration greater than the PRG (Includes transport to land cost). Assume MD 200 cy/day of (77,822 - 15,564 cy) affected sediment су 62258 \$30 14 Screening day 104 \$2,500 \$259,407 Screening system to separate wood from sediments 15 Air Emissions Monitoring weeks 45 \$8,725 \$392,625 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods 16 Water Quality Monitoring weeks 38 \$9,000 \$342,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste) \$35 \$81 17 Dewatering - Filterpress су 18677 \$653,695 Total dredged minus wood and include 20 % for fines only, rate based on bids \$3.017.866 Cost based on FRTR site quide with 15% cement added, Includes all costs minus mob/demob for a 50.000 vard soil site using RACER software 18 Stabilization 37258 cy 19 Cap shoreline slope 19259 \$25 cy 20 Benthic Habitat/Thin layer 10180 \$18 \$183,240 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area. \$11,665,778 Transport & Disposal Item No. Unit Quanitity **Unit Cost** Total \$103,570 40 trucks/day X 20 tons/truck = 800 tons/day day \$1,440 72 2 Haul to landfill ton 57539 \$27 \$1,562,896 Truck all sediment to Seven Mile LF - Eau Claire 3 Disposal 57539 \$18 \$1,035,698 Tipping Fee Subtotal \$2,702,164 Water Treatment: Quanitity **Unit Cost** Item No. Unit Total Notes 1 Pond and Sand Filter Capital Cost \$852,682 \$852,682 ea 2 Oil Water Separator \$25,000 \$50,000 3 Oil Water Separator O&M Mgal 7.79 \$2,700 \$21.022 Stryker Bay Cost Estimates (See CDF cost Sheet) 4 Carbon Sand Filtration Mgal 7.79 \$67,000 \$521,654 5 Water Quality Testing \$18,686 Mgal 7.79 \$2,400 6 O&M 104 \$2,400 \$249,030 dav Subtotal \$1,713,075 Capping: Item No. o. Item
1 Liner of GCL mat or GAC mat Quanitity Unit Cost \$1.50 otal Notes
\$490,050 GCL or GAC mat to retard contaminant transport and provide a stable cap base sq ft 326700 \$326,700 Installation of organic clay liner and geosynthetic. Assume 1 acres/day at \$4000/day 2 Mat liner installation 326700 sa ft \$1 4 Stone Cover ton \$35 \$635,250 Includes cost for barge. Assumes stone placement same time as sand cover 1 ft thick 5 Sand Cover Fill 6050 \$25 \$151,250 Average of 0.5 ft to level after dredging for mat placement and for thin cap area су 6 Sand Cover & install су 30250 \$25 \$756,250 2.5 ft sand cover \$54,400 ~2600 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1360 tons @ 130 pcf 7 Install Rip-Rap Shore Protection ton 1360 \$40 \$37 500 \$37,500 Post-Capping sand before rock Bathymetric Survey 8 Survey \$2,451,400 Subtotal MISC Unit Quanitity **Unit Cost** 1 Develop HASP \$10,000 \$100/hr X 40 hr/wk X 2.5 weeks \$10,000 \$109,440 Once a week, for 2 years (38 weeks/yr) 2 Health & Safety Personnel weeks 76 \$1,440 Subtotal \$119,440 Total: Engineering @ 15%: \$2,937,667 \$2,937,667 Oversight @ 15%: Subtotal \$25,459,784 Contingency @ 20%: \$3,916,890 Only taken on Capital Costs not Engineering

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total	<u>Notes</u>
1 Monitoring		yr	30	\$40,000	\$1,200,000	Monitor locations with PRG for length determined by US EPA
2 Reporting		yr	30	\$12,000	\$360,000	Post-Closure Reporting
3 O&M		yr	30	\$10,000	\$300,000	Comments from 2 bidders
				Subtotal	\$1,860,000	)
Present wo	orth @ 7% discount factor				\$715.090	

GRAND TOTAL: \$30,091,764

		Cos	t + Oversight		
Summary (Capital Costs)	Cost	&	Engineering	Co	ontingency
Mob/demob & Misc	\$ 1,052,033	\$	1,367,643	\$	210,407
Dredge and Sediment Handling	\$ 11,665,778	\$	15,165,512	\$	2,333,156
Transport & Disposal	\$ 2,702,164	\$	3,512,813	\$	540,433
Water Treatment	\$ 1,713,075	\$	2,226,997	\$	342,615
Сар	\$ 2,451,400	\$	3,186,820	\$	490,280
Total Estimated Cost	\$ 19,584,449	\$	25,459,784	\$	3,916,890

Total Capital Cost With Contingency \$ 29,376,674

Based upon GIS calculations

Based upon GIS calculations

Assume large wood waste is 20% of total sediments

Weight estimate based on SG = 2.6 dry weight, 65% solids for disposal

Total Area

Total Sediment Volume:

Total Sediment Weight:

Total Volume of Wood Waste:

696,960 sa ft

77,822 cy

15,564 cy

33,999 tons

Water volume estimate based on 46% solid content by volume to 65% solids plus 20% Total Volume of Water: 7.79 Mgal Mob/Demob Unit Quanitity **Unit Cost** <u>Total</u> \$1.071.909 Estimate at 5% of total costs except without engineering, contingency and LT monitoring Mob/Demob \$1.071.909 **Mechanical Dredging & Sediment Treatment** Unit Quanitity **Unit Cost** Total Notes \$100,000 . Item 1 Move/Abandon Existing Utilities \$100,000 \$121,275 \$15/hr X 24 hr X 7 days + \$25/day (expenses) 2 24 hr. Security of Site weekly 45 \$2,695 3 Perimeter Fence In ft \$50,560 Fence along land side 2528 \$20 4 Survey 5 Install Sheet pile outside dredge area \$37,500 \$112,500 Pre- and Post Dredge and Post cap - Bathymetric Survey \$2,160,000 Install sheet pile wall instead of silt curtains
\$21,840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore sq ft 45000 \$48 6 Install HC Boom ft 5460 \$4 7 HC Boom Debris Disposal Labor \$3,000 \$6,000 Remove debris twice during dredging using a barge ea 8 Debris Disposal \$1,500 \$3,000 Dispose of debris in 20 cy. roll off box 9 HC Boom Removal 5460 \$21,840 Removal of HC Boom into roll off box ft \$4 10 Dispose of Boom \$1,500 \$3,000 Dispose of HC Boom in two 20 cy. roll off boxes ea 11 Large Wood Waste Removal cy ea 15564 \$700,398 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cy \$1.500 \$1,167,330 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (15,564 cy)/20 cy/box
\$1,867,728 Mechanically dredge sediments with a concentration greater than the PRG (Includes transport to land cost). Assume MD 200 cy/day of (77,822 - 15,564 cy) affected sediment 12 Large Wood Waste Disposal 778 13 Mechanically Dredge Sediment cy day 62258 \$30 \$259,407 Screening system to separate wood from sediments 14 Screening 104 \$2,500 15 Air Emissions Monitoring weeks 45 \$8,725 \$392,625 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods 16 Water Quality Monitoring \$342,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste) weeks 38 \$9,000 17 Dewatering - Mechanical & Gravity Methods 62258 \$35 \$2,179,016 Total dredged minus wood, rate based on bids CV 18 Cap shoreline slope 19259 \$25 \$481,475 2'x100'x1500' \$183,240 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area. 19 Benthic Habitat/Thin laver 10180 \$18 Subtotal Thermal Treatment Quanitity Unit Cost \$100 <u>Total</u> \$5,230,796 Bid of \$80/ton plus misc items \$20/ton = \$100/ton Thermal Trearment ton 52308 Transport & Disposal <u>Unit Cost</u> \$1,440 Item No. Unit Quanitity <u>Total</u> \$67,317 40 trucks/day X 20 tons/truck = 800 tons/day day \$27 \$18 2 Haul to landfill ton 37398 \$1,009,756 Truck all sediment to Seven Mile LF - Eau Claire Plus 10% for stabilization & excess moisture \$673,170 Tipping Fee 3 Disposal ton 37398 Subtotal Water Treatment: Item No. Unit Quanitity **Unit Cost** Total \$852,682 Notes Pond and Sand Filter ea ea \$852,682 \$25,000 2 Oil Water Separator \$50,000 3 Oil Water Separator O&M Mgal 7.79 \$2,700 \$21,022 Stryker Bay Cost Estimates (See CDF cost Sheet) 4 Carbon Sand Filtration Mgal Mgal 7.79 \$67,000 \$521,654 5 Water Quality Testing 7.79 \$2,400 \$18,686 6 O&M day \$2,400 \$249,030 Subtotal \$1,713,075 Capping: Unit Cost \$1.50 Item No. Item

1 Liner of GCL mat or GAC mat Quanitity 326700 Unit Total Notes
\$490,050 One layer of either geotextile mat to retard contaminant transport and provide a cap base sa ft 2 Mat liner installation sq ft 326700 \$326,700 Installation of organic clay liner and geosynthetic. Assume 1 acres/day at \$4000/day 4 Stone Cover ton 18150 \$35 \$635,250 Includes cost for barge. Assumes stone placement same time as sand cover 1 ft thick 5 Sand Cover Fill \$151,250 Average of 0.5 ft to level after dredging for mat placement су 6050 \$25 6 Sand Cover & install 30250 \$25 \$756,250 2.5 ft sand cover CV \$54,400 ~2600 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1360 tons @ 130 pcf 7 Install Rip-Rap Shore Protection 1360 \$40 \$37,500 8 Survey ea \$37,500 Post-Capping sand before rock-Bathymetric Survey \$2,451,400 Subtotal MISC Quanitity Unit Cost Total Notes \$10,000 \$100/hr X 40 hr/wk X 2.5 weeks Item No. Unit Item 1 Develop HASP \$10,000 2 Health & Safety Personnel week 76 \$1.440 \$109,440 Once a week, for 2 years (38 weeks/yr) Subtotal \$119,440 Total: \$22 510 096 Engineering @ 15%: \$3,376,514 Oversight @ 15%: Subtotal \$29,263,125 \$4,502,019 Only taken on Capital Costs not Engineering Contingency @ 20%: \$33,765,144 TOTAL .

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total	Notes
1 Monito	ring	yr	30	\$40,000	\$1,200,000	Monitor locations with PRG for length determined by US EPA
2 Report	ing	yr	30	\$12,000	\$360,000	Post-Closure Reporting
3 O&M		yr	30	\$10,000	\$300,000	
				Subtotal	\$1,860,000	
Preser	it worth @ 7% discount factor				\$715,090	

GRAND TOTAL: \$34,480,234

			Cos	st + Oversight		
Summary		Cost	&	Engineering	C	ontingency
Mob/demob & Misc	\$	1,191,349	\$	1,548,754	\$	238,270
Dredge and Sediment Handling	\$	10,173,234	\$	13,225,204	\$	2,034,647
Thernal Treatment	\$	5,230,796	\$	6,800,034	\$	1,046,159
Transport & Disposal	\$	1,750,243	\$	2,275,316	\$	350,049
Water Treatment	\$	1,713,075	\$	2,226,997	\$	342,615
Cap	\$	2,451,400	\$	3,186,820	\$	490,280
Total Estimated Cost	\$	22,510,096	\$	29,263,125	\$	4,502,019
	Tot	Total Capital Cost With Contingency \$33				

Total Voli To	Total Area: al Sediment Volume: ume of Wood Waste: tal Sediment Weight: otal Volume of Water:	696,960 77,822 15,564 33,999	cy cy tons	Based upon GIS calculations Based upon GIS calculations Assume large wood waste is 20% of total sediments Weight estimate based on SG = 2.6 dry weight, 65%solids for disposal Water volume estimate based on 46% solid content by volume to 65% solids plus 20%
Mob/Demob	<u>Unit</u>	Quanitity	Unit Cost	<u>Total</u>
Mob/Demob	Is	1	\$1,132,426	\$1,132,426 Estimate at 5% of total costs except without engineering, contingency and LT monitoring
Hydraulic Dredging & Sediment Treatment				
Item No. Item  1 Survey	<u>Unit</u> ea	Quanitity 3	Unit Cost \$37,500	Total Notes \$112,500 Pre- and Post Dredge - Bathymetric Survey
2 Move/Abandon Existing Utilities	Is	1	\$100,000	\$100,000
3 24 hr. Security of Site 4 Perimeter Fence	weekly In ft	45 2528	\$2,695 \$20	\$121,275 \$15/hr X 24 hr X 7 days + \$25/day (expenses) \$50,560 Fence along land side
5 Install Sheet pile outside dredge ar	ea sq ft	45000	\$48	\$2,160,000 Install sheet pile wall instead of silt curtains
6 Install HC Boom 7 HC Boom Debris Disposal Labor	ft	5460 2	\$4 \$3,000	
8 Debris Disposal	ea ea	2	\$1,500	
9 HC Boom Removal	ft	5460	\$4	\$21,840 Removal of HC Boom into roll off box
10 Dispose of Boom 11 Large Wood Waste Removal	ea cy	2 15564	\$1,500 \$45	
12 Large Wood Waste Disposal	ea	778	\$1,500	\$1,167,330 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (15,564 cy)/20 cy/box
<ul><li>13 Hydraulically Dredge Sediment</li><li>14 Screening</li></ul>	cy day	62258 104	\$30 \$2,500	
15 Air Emissions Monitoring	weeks	45	\$8,725	
16 Water Quality Monitoring	weeks	38	\$9,000	\$342,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste)
17 Dewatering - Filterpress 18 Stabilization	cy cy	62258 11177	\$35 \$81	\$2,179,016 Total dredged minus wood, rate based on bids \$905,337 Total dredged minus wood and include 30 % for fines only, rate based on bids
19 Cap shoreline slope	су	19259	\$25	\$481,475 2'x100'x1500'
20 Benthic Habitat/Thin layer	су	10180	\$18 Subtotal	\$183,240 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area. \$11,078,571
Transport & Disposal				
Item No.	<u>Unit</u>	Quanitity	Unit Cost	Total
1 Load	day	72	\$1,440	\$103,570 40 trucks/day X 20 tons/truck = 800 tons/day
2 Haul to landfill 3 Disposal	ton ton	57539 57539	\$27 \$18	\$1,553,546 Truck all sediment to Seven Mile LF - Eau Claire plus 10% for stabilization & excess moisture \$1,035,698 Tipping Fee
o Disposa.	1011	0,000	Subtotal	\$2,692,614
Water Treatment:				
Item No. Item	<u>Unit</u>	Quanitity	Unit Cost	<u>Total</u> <u>Notes</u>
Pond and Sand Filter Capital Cost     Oil Water Separator	ea ea	1 2	\$852,682 \$25,000	\$852,682 \$50,000
3 Oil Water Separator O&M	Mgal	70	\$2,700	\$50,000 \$188,943
4 Carbon Sand Filtration	Mgal	70	\$67,000	\$4,688,584 Stryker Bay Cost Estimates (See CDF cost Sheet)
5 Water Quality Testing 6 O&M	Mgal dav	70 104	\$2,400 \$2,400	\$167.949 \$249.030
	,		Subtotal	\$6,197,188
Capping:				
Item No. Item	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
<ol> <li>Liner of GCL mat or GAC mat</li> </ol>	sq ft	326700	\$1.5	
Mat liner installation     Stone Cover	sq ft ton	326700 18150	\$1 \$35	\$326,700 Installation of organic clay liner and geosynthetic. Assume 1 acres/day at \$400/day \$635,250 Includes cost for brance, Assumes stone placement same time as sand cover 1 ft thick
5 Sand Cover Fill	су	10415	\$25	\$260,365 Average of 0.5 ft to level after dredging for mat placement
6 Sand Cover & install	cy	30250 1360	\$25 \$40	
7 Install Rip-Rap Shore Protection 8 Survey	ton ea	1360	\$40 \$37,500	
•			Subtotal	\$2,560,515
MISC				
Item No. Item	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
Develop HASP     Health & Safety Personnel	ls day	1 76	\$10,000 \$1,440	\$10,000 \$100/hr X 40 hr/wk X 2.5 weeks \$109,440 Once a week, for 2 years (38 weeks/yr)
2 Health & Salety Personner	uay	10	Subtotal	\$109,440 Unice a week, for 2 years (36 weeks/yr) \$119,440
		E,	Total: ngineering @ 15%:	\$23,780,954 \$3,567,143
			Oversight @ 15%:	\$3,567,143
		-	Subtotal:	\$30,915,240 St. 756,101 Only taken as Capital Costs and Engineering
		Co	ontingency @ 20%: TOTAL:	\$4,756,191 Only taken on Capital Costs not Engineering \$35,671,431
				eren ere

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total	<u>Notes</u>
1 Monitoring	9	yr	30	\$40,000.00	\$1,200,000	Monitor locations with PRG for length determined by US EPA
2 Reporting		yr	30	\$12,000.00	\$360,000	Post-Closure Reporting
3 O&M		yr	30	\$10,000.00	\$300,000	)
				Subtotal	\$1,860,000	)
Present w	orth @ 7% discount factor				\$715.090	

GRAND TOTAL: \$36,386,521

		Cos	st + Oversight		
Summary	Cost	&	Engineering	Co	ontingency
Mob/demob & Misc	\$ 1,251,866	\$	1,627,426	\$	250,373
Dredge and Sediment Handling	\$ 11,078,571	\$	14,402,142	\$	2,215,714
Transport & Disposal	\$ 2,692,814	\$	3,500,658	\$	538,563
Water Treatment	\$ 6,197,188	\$	8,056,344	\$	1,239,438
Сар	\$ 2,560,515	\$	3,328,670	\$	512,103
Total Estimated Cost	\$ 23,780,954	\$	30,915,240	\$	4,756,191

Total Capital Cost With Contingency \$ 35,671,431

	Total Area Total Sediment Volume: Total Volume of Wood Waste: Total Sediment Weight: Total Volume of Water:	77,822 15,564 33,999	cy	Based upon GIS calculations Based upon GIS calculations Assume large wood waste is 20% of total sediments Weight estimate based on SG = 2.6 dry weight, 65%solids for disposal Water volume estimate based on 46% solid content by volume to 65% solids plus 20%
Mob/Demob	11-2	O	H-2 01	
Mob/Demob	<u>Unit</u> Is	Quanitity 1	<u>Unit Cost</u> \$1,301,571	Total \$1,301,571 Estimate at 5% of total costs except without engineering, contingency and LT monitoring
Hydraulic Dredging				
Item No. Item 1 Survey	Unit ea	Quanitity 3	Unit Cost \$37,500	Total Notes
2 Move/Abandon Existing U		1	\$37,500	
3 24 hr. Security of Site	weekly	45	\$2,695	5 \$121,275 \$15/hr X 24 hr X 7 days + \$25/day (expenses)
4 Perimeter Fence 2 Install Sheet pile outside d	In ft redge area sg ft	2528 45000	\$20 \$48	\$50,560 Fence along land side \$2,160,000 Install sheet pile wall instead of silt curtains
6 Install HC Boom	euge area sq it	5460	\$40 \$4	
7 HC Boom Debris Disposal	Labor ea	2	\$3,000	\$6,000 Remove debris twice during dredging using a barge
Debris Disposal     HC Boom Removal	ea	2 5460	\$1,500 \$4	
10 Dispose of Boom	ft ea	2	\$4 \$1,500	
11 Large Wood Waste Remov	al cy	15564	\$45	\$700,398 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cy
12 Large Wood Waste Dispos		778	\$1,500	
13 Mechanically Dredge Sedi 14 Screening	nent cy day	62258 104	\$30 \$2,500	
15 Air Emissions Monitoring	weeks	45	\$8,725	\$392,625 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods
16 Water Quality Monitoring	weeks	38	\$9,000	
<ul><li>17 Dewatering - Filterpress</li><li>18 Cap shoreline slope</li></ul>	cy	62258 19259	\$35 \$25	
19 Install Rip-Rap Shore Prot	cy ection ton	1360	\$25 \$40	
20 Benthic Habitat/Thin layer	су	10180	\$18 Subtotal	
Thermal Treatment Thermal Trearment	<u>Unit</u>	Quanitity 52308	Unit Cost \$100	Total \$5,230,796 Bid of \$80/ton plus misc items \$20/ton = \$100/ton
Transport & Disposal			,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	11-2	O	Hali Oaar	
Item No. 1 Load	<u>Unit</u> day	Quanitity 47	Unit Cost \$1,440	Total S5.317 40 trucks/dav X 20 tons/truck = 800 tons/dav
2 Haul to landfill	ton	37398	\$27	\$1,009,756 Weight plus 10% for wetting Truck all sediment to Seven Mile LF - Eau Claire
3 Disposal	ton	37398	\$18 Subtotal	
Water Treatment:				
Itam Na Itam	Iluia	Quanitity	Unit Cost	Tatal Nation
Item No. Item  1 Pond and Sand Filter Capi	al Cost ea	Quantity 1	\$852,682	Total Notes 2 \$852.682
2 Oil Water Separator	ea	2	\$25,000	
3 Oil Water Separator O&M 4 Carbon Sand Filtration	Mgal Mgal	70 70	\$2,700 \$67,000	
5 Water Quality Testing	Mgal	70	\$2,400	
6 O&M	day	104	\$2,400	\$249,030
			Subtotal	1 \$6,197,188
Capping:				
Item No. Item	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
1 Liner of GCL mat or GAC	nat sq ft	326700	\$1.5	\$490,050 One layer of either geotextile mat to retard contaminant transport and provide a cap base
Mat liner installation     Stone Cover	sq ft ton	326700 18150	\$1 \$35	
5 Sand Cover Fill	cy	10415	\$25	
6 Sand Cover & install	су	30250	\$25	\$ \$756,250 2.5 ft sand cover
8 Survey	ea	1	\$37,500 Subtotal	
MISC				
Item No. Item	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
1 Develop HASP	Is	1	\$10,000	\$10,000 \$100/hr X 40 hr/wk X 2.5 weeks
2 Health & Safety Personnel	day	76	\$1,440 Subtotal	
			Total:	\$27,332,986
			Engineering @ 15%:	\$4,099,948
			Oversight @ 15%: Subtotal:	
		(	Subtotal: Contingency @ 20%:	
		`	TOTAL	

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total	Notes
1	Monitoring	yr	30	\$40,000.00	\$1,200,000	Monitor locations with PRG for length determined by US EPA
2	Reporting	yr	30	\$12,000.00	\$360,000	Post-Closure Reporting
3	O&M	yr	30	\$10,000.00	\$300,000	
				Subtotal	\$1,860,000	
	Present worth @ 7% discount factor				\$715,090	

GRAND TOTAL: \$41,714,569

Total Capital Cost With Contingency \$ 40,999,479

		Cos	t + Oversight		
Summary	Cost	&	Engineering	Co	ontingency
Mob/demob & Misc	\$ 1,421,011	\$	1,847,314	\$	284,202
Dredge and Sediment Handling	\$ 10,227,634	\$	13,295,924	\$	2,045,527
Thermal Treatment	\$ 5,230,796	\$	6,800,034	\$	1,046,159
Transport & Disposal	\$ 1,750,243	\$	2,275,316	\$	350,049
Water Treatment	\$ 6,197,188	\$	8,056,344	\$	1,239,438
Cap	\$ 2,506,115	\$	3,257,950	\$	501,223
Total Estimated Cost	\$ 27,332,986	\$	35,532,882	\$	5,466,597

Based upon GIS calculations
Based upon GIS calculations
Assume large wood waste is 20% of total sediments
Weight estimate based on SG = 2.6 dry weight, 65%solids for disposal
Water volume estimate based on 46% solid content by volume and 65% for dewatering, plus 20% 696,960 sq ft 133,906 cy 26,781 cy 58,500 tons Total Area: Total Sediment Volume:
Total Volume of Large Wood Waste:
Total Sediment Weight: Total Volume of Water: 13.39 Mgal

Mob/Demob

Mob/Demob	Unit	Quanitity	<u>Unit Cost</u>	<u>Total</u>
	Is	1	\$1,287,762	\$1,287,762 Approx 5% total cost
Mechanical Dredging & Sediment Treatment				

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total Notes
1 Survey		ea	2	\$37,500	\$75,000 Pre- and Post- Bathymetric Survey
2 Move/Aband	don Existing Utilities	ls	1	\$100,000	\$100,000
3 24 hr. Secur	rity of Site	weekly	90	\$2,695	\$242,550 \$15/hr X 24 hr X 7 days + \$25/day (expenses)
4 Perimeter F	ence	In ft	2528	\$20	\$50,560 Fence along land side
5 Install sheet	t pile outside dredge area	sq ft	45000	\$48	\$2,160,000 Install sheet pile wall instead of silt curtains
6 Install HC B	Boom	ft	5460	\$4	\$21,840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore
7 HC Boom D	ebris Disposal Labor	ea	2	\$3,000	\$6,000 Remove debris twice during dredging using a barge
8 Debris Dispo	osal	ea	2	\$1,500	\$3,000 Dispose of debris in 20 cy. roll off box
9 HC Boom R	Removal	ft	5460	\$4	\$21,840 Removal of HC Boom into roll off box
10 Dispose of E	Boom	ea	2	\$1,500	\$3,000 Dispose of HC Boom in two 20 cy. roll off boxes
11 Large Wood	d Waste Removal	cy	26781	\$45	\$1,205,150 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cy
12 Screening		day	179	\$2,500	\$446,352 Screening system to separate wood from sediments
13 Large Wood	d Waste Disposal	ea	1339	\$1,500	\$2,008,583 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (26,781 cy)/20 cy/box
14 Dredge Sed	diment	cy	107124	\$30	\$3,213,733 Mechanically dredge sediments with a concentration greater than the PRG (Includes transport to land cost). Assume MD 200 cy/day of (133,096 - 26,781 cy) affected sediment
15 Air Emission	ns Monitoring	weeks	90	\$8,725	\$785,250 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods
16 Water Quali	ity Monitoring	weeks	76	\$9,000	\$684,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste)
17 Dewatering	- Filterpress	cy	32137	\$35	\$1,124,795 Total dredged minus wood and 30 % for fines only, rate based on bids
18 Stabilization	1	cy	64124	\$81	\$5,194,079 Cost based on FRTR site guide with 15% cement added. Includes all costs minus mob/demob for a 50,000 yard soil site using RACER software
19 Cap shorelir	ne slope	cy	38519	\$25	\$962,975 4'x100'x1500' plus 0.5 ft cap in dredge area
20 Install Rip-R	Rap Shore Protection	ton	1360	\$40	\$54,400 ~2600 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1360 tons @ 130 pcf
21 Benthic Hab	oitat/Thin layer	cy	12907	\$18	\$232,320 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area.
				Subtotal	\$18,595,427
Transport & Disposal					
Item No.		<u>Unit</u>	Quanitity	Unit Cost	<u>Total</u>
1 Load		day	124	\$1,440	\$178,236 40 trucks/day X 20 tons/truck = 800 tons/day
2 Haul to land	fill	ton	99020	\$27	\$2,673,547 Sediment less wood plus stabilizer 10% Truck all sediment to Seven Mile LF - Eau Claire
3 Disposal		ton	99020	\$18	\$1,782,365 Sediment less wood plus stabilizer 10% Truck all sediment to Seven Mile LF - Eau Claire
				Subtotal	\$4,634,149

# Water Treatment:

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total Not	es
1 Pond a	nd Sand Filter	ea	1	\$852,682	\$852,682	
2 Oil Wat	er Separator	ea	2	\$25,000	\$50,000	
3 Oil Wat	er Separator O&M	Mgal	13.39	\$2,700	\$36,160	
4 Carbon	Filtration	Mgal	13.39	\$67,000	\$897,304	Stryker Bay Cost Estimates (See CDF cost Sheet)
5 Water 0	Quality Testing	Mgal	13.39	\$2,400	\$32,142	
6 O&M	· -	day	179	\$2,400	\$428,498	
				Subtotal	\$2,296,786	

Unit Cost

### Misc:

1 Develop 2 Health	Item D HASP & Safety Personnel	<u>Unit</u> Is day	Quanitity 1 152	Unit Cost \$10,000 \$1,440 Subtotal		Notes \$100/hr X 40 hr/wk X 2.5 weeks Once a week, for duration of project, doubled based on bidders comments
				Total: Engineering @ 15%: Oversight @ 15%: Subtotal: Contingency @ 20%: TOTAL:	\$27,043,004 \$4,056,451 \$4,056,451 \$35,155,906 \$5,408,601 <b>\$40,564,506</b>	) Only taken on Capital Costs not Engineering

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total Notes
1 N	Monitoring	yr	30	\$40,000.00	\$1,200,000 Monitor locations with PRG for length determined by US EPA
2 F	Reporting	yr	30	\$12,000.00	\$360,000 Post-Closure Reporting
3 C	D&M	yr	30	\$10,000.00	\$300,000
				Subtotal	\$1,860,000
P	resent worth @ 7% discount factor				\$715,090

GRAND TOTAL: \$41,279,596

		Cos	t + Oversight		
Summary	Cost	&	Engineering	Co	ntingency
Mob/demob & Misc	\$ 1,516,642	\$	1,971,635	\$	303,328
Dredge	\$ 18,595,427	\$	24,174,055	\$	3,719,085
Transport and Disposal	\$ 4,634,149	\$	6,024,394	\$	926,830
Water Treatment	\$ 2,296,786	\$	2,985,822	\$	459,357
Total Estimated Cost	\$ 27,043,004	\$	35,155,906	\$	5,408,601

Total Capital Cost With Contingency \$ 40,564,506

Total Area: 696,960 sq ft
Total Sediment Volume: 133,906 cy
Based upon GIS calculations
Based upon GIS calculation

Mob/Demob				
	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
Mob/Demob	Is	1	\$1,528,250	<b>\$1,528,250</b> Approx 5% total cost
Mechanical Dredging & Sediment Treatment				
Item No. Item	Unit	Quanitity	Unit Cost	Total Notes
1 Survey	ea	2	\$37,500	\$75,000 Pre- and Post- Bathymetric Survey
2 Move/Abandon Existing Utilities	Is	1	\$100,000	\$100,000
3 24 hr. Security of Site	weekly	90	\$2,695	\$242,550 \$15/hr X 24 hr X 7 days + \$25/day (expenses)
4 Perimeter Fence	In ft	2528	\$20	\$50,560 Fence along land side
5 Install Sheet pile outside dredge area	sq ft	45000	\$48	\$2,160,000 Install sheet pile wall instead of silt curtains
6 Install HC Boom	ft	5460	\$4	\$21,840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore
7 HC Boom Debris Disposal Labor 8 Debris Disposal	ea	2 2	\$3,000 \$1,500	\$6,000 Remove debris twice during dredging using a barge \$3,000 Dispose of debris in 20 cy, roll off box
9 HC Boom Removal	ea ft	5460	\$1,500	so, our bispusse of usefuls in it or yet, foll of took \$21,840 Removal of HC Boom into roll off box
10 Dispose of Boom	ea	2	\$1.500	\$21,040 Relinoval of the Boom in two 20 cy. roll off boxes
11 Large Wood Waste Removal	cy	26781	\$45	\$1,205,150 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cy
12 Screening	day	179	\$2,500	\$446,352 Screening system to separate wood from sediments
13 Large Wood Waste Disposal	ea	1339	\$1,500	\$2,008,583 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (26,781 cy)/20 cy/box
14 Dredge Sediment	cy	107124	\$30	\$3,213,733 Mechanically dredge sediments with a concentration greater than 10 ppm (Includes transport to land cost). Assume MD 200 cy/day of (133,096 - 26,781 cy) affected sediment
15 Air Emissions Monitoring	weeks	90	\$8,725	\$785,250 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods
16 Water Quality Monitoring	weeks	76	\$9,000	\$684,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste)
17 Dewatering - Mechanical & Gravity Methods	cy	107124	\$35	\$3,749,355 Total dredged minus wood, rate based on bids
18 cap shoreline slope	cy	38519	\$25	\$962,975 4'x100'x1500' plus 0.5 ft cap in dredge area
19 Install Rip-Rap Shore Protection	ton	1360	\$40	\$54,400 ~2600 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1360 tons @ 130 pcf
20 Benthic Habitat/Thin layer	cy	12907	\$18	\$232,320 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area.
			Subtotal	\$16,025,908
Thermal Treatment	Unit	Quanitity	Unit Cost	Total Notes
Thermal Trearment	ton	90018	\$100	\$9,001,843 Bid of \$80/ton plus misc items \$20/ton = \$100/ton
Transport & Disposal				
Item No.	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
1 Load	day	80	\$1,440	\$115,830_40 trucks/day X 20 tons/truck = 800 tons/day
Haul to landfill     Disposal	ton ton	64350 64350	\$27 \$18	\$1,737,450 Truck all sediment to Seven Mile LF - Eau Claire plus 10% wetting \$1,158,300 Tipping Fee
3 Disposai	tori	04330	Subtotal	\$1,150,000 ripping liee \$3,01,581
			oubtota.	VIII.
Water Treatment:				
Item No. Item	Unit	Quanitity	Unit Cost	Total Notes
Item No. Item  1 Pond and Sand Filter Capital Cost	ea	1	\$852.682	10tal Notes \$852 682
2 Oil Water Separator	ea	2	\$25,000	\$50,000
3 Oil Water Separator O&M	Mgal	13.4	\$2,700	\$36.160
4 Carbon Filtration	Mgal	13.4	\$67,000	\$897,304 Stryker Bay Cost Estimates (See CDF cost Sheet)
5 Water Quality Testing	Mgal	13.4	\$2,400	\$32,142
6 O&M	day	179	\$2,400	\$428,498
			Subtotal	\$2,296,786
Misc:				
Item No. Item	<u>Unit</u>	Quanitity	Unit Cost	Total Notes
Develop HASP     Health & Safety Personnel	ls dav	152	\$10,000 \$1,440	\$10,000 \$100/hr X 40 hr/wk X 2.5 weeks \$218,880 Once a week, for duration of project, doubled based on bidders comments
2 Health & Salety Personner	uay	152	Subtotal	\$2.10,000 Order a week, for duration or project, doubled based on biddens confinents \$228,880
			Junioldi	APPONAGO
			Total:	\$32,093,248
		E	ngineering @ 15%:	\$4,813,987
			Oversight @ 15%:	\$4,813,987
			Subtotal:	\$41,721,222
		C	ontingency @ 20%:	\$6,418,650 Only taken on Capital Costs not Engineering
			TOTAL:	\$48,139,872

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total	Notes	
1 Mor	itoring	yr	30	\$40,000	\$1,200,000	0 Monitor locations with P	'RG for length determined by US EPA
2 Rep	orting	yr	30	\$12,000	\$360,000	0 Post-Closure Reporting	
3 O&	И	yr	30	\$10,000	\$300,000	0	
				Subtotal	\$1,860,00	0	
Pre	sent worth @ 7% discount factor				\$715,090	)	

GRAND TOTAL: \$48,854,962

		<u>c</u>	versight &		
Summary	Cost	E	ngineering	Co	ontingency
Mob/demob & Misc	\$ 1,757,130	\$	2,284,269	\$	351,426
Dredge	\$ 16,025,908	\$	20,833,681	\$	3,205,182
Thermal Treatment	\$ 9,001,843	\$	11,702,396	\$	1,800,369
Transport and Disposal	\$ 3,011,581	\$	3,915,055	\$	602,316
Water Treatment	\$ 2,296,786	\$	2,985,822	\$	459,357
Total Estimated Cost	\$ 32,093,248	\$	41,721,222	\$	6,418,650

Total Capital Cost With Contingency \$ 48,139,872

Cost +

Subtotal:

Contingency @ 20%: TOTAL • \$44,112,171

\$50.898.658

\$6,786,488 Only taken on Capital Costs not Engineering

Mob/Demob Unit Costs \$1,615,830.42 <u>Total</u> <u>Notes</u> \$1,615,830 Approx 5% total cost Unit Quamtity Mob/Demob Mechanical Dredging & Sediment Treatment Item No. Quamtity **Unit Costs** Total Notes \$75,000 Pre- and Post- Bathymetric Survey 1 Survey \$37.500 ea Is 2 Move/Abandon Existing Utilities \$100,000 \$100,000 3 24 hr. Security of Site weekly 90 \$2,695 \$242,550 \$15/hr X 24 hr X 7 days + \$25/day (expenses) \$50,560 Fence along land side \$2,160,000 Install sheet pile wall instead of silt curtains 4 Perimeter Fence In ft 2528 \$20 5 Install Sheet pile outside dredge area 45000 \$48 sq ft 6 Install HC Boom 5460 \$21,840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore 7 HC Boom Debris Disposal Labor \$3.000 ea \$6,000 Remove debris twice during dredging using a barge \$3,000 Dispose of debris in 20 cy. roll off box 8 Debris Disposal \$1,500 ea 9 HC Boom Removal 5460 \$21,840 Removal of HC Boom into roll off box \$1.500 10 Dispose of Room ea \$3,000 Dispose of HC Boom in two 20 cv. roll off boxes \$1,205,150 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cy 11 Large Wood Waste Removal 26781 \$45 cy day 12 Screening \$2,500 \$446,352 Screening system to separate wood from sediments 13 Large Wood Waste Disposal \$2,008,583 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (26,781 cy)/20 cy/box
\$3,213,733 Mechanically dredge sediments with a concentration greater than 10 ppm (Includes transport to land cost). Assume MD 200 cy/day of (133,096 - 26,781 cy) affected sediment ea 1339 \$1.500 14 Dredge Sediment 107124 \$30 CV 15 Air Emissions Monitoring \$8,725 \$785,250 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods weeks \$684,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste) \$3,749,355 Total dredged minus wood, rate based on bids 16 Water Quality Monitoring weeks \$9,000 17 Dewatering - Filterpress 107124 су \$35 18 Stabilization 19237 \$1,558,197 Cost based on FRTR site guide with 15% cement added. Assumes 30% fines still need stabilization. Includes all costs minus mob/demob for a 50,000 yard soil site using RACER software cy \$962,975 4'x100'x1500' plus 0.5 ft cap in dredge area \$54,400 ~2600 lf of shorline inside 2900N. 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1360 tons @ 130 pcf 19 Cap shoreline slope 38519 \$25 20 Install Rip-Rap Shore Protection 1360 ton \$40 21 Benthic Habitat/Thin layer \$18 \$232,320 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area. су Subtotal \$17.584.105 Transport & Disposal Unit Quanitity **Unit Cost** \$1,440 \$178,236 40 trucks/day X 20 tons/truck = 800 tons/day 1 Load day ton 124 \$2,475,507 Sediment weight plus 10% - Truck all sediment to Seven Mile LF - Eau Claire 2 Haul to landfill 99020 \$25 3 Disposal ton 99020 \$18 \$1,782,365 Tipping Fee Subtotal \$4,436,108 Water Treatment: Item No. Unit Quanitity Unit Cost Total Notes 1 Pond and Sand Filter ea ea \$852,682 \$852,682 2 Oil Water Separator \$25,000 \$50,000 3 Oil Water Separator O&M \$2,700 \$327,158 Mgal 121 4 Carbon Filtration Mgal 121 \$67,000 \$8,118,370 Stryker Bay Cost Estimates (See CDF cost Sheet) 5 Water Quality Testing Mgal 121 \$2.400 \$290.807 6 O&M \$2,400 \$428,498 179 dav Subtotal \$10,067,515 Misc: 1 Develop HASP Unit Cost \$10,000 Quanitity Unit Total Notes \$10,000 \$100/hr X 40 hr/wk X 2.5 weeks 2 Health & Safety Personnel week 152 \$1.440 \$218,880 Once a week, for duration of project \$228,880 Subtotal Total: \$33,932,439 Engineering @ 15%: \$5,089,866 Oversight @ 15%: \$5,089,866

Item No.	<u>ltem</u>	Unit	Quanitity	Unit Cost	Total Notes
1 Monitoring		yr	30	\$40,000	\$1,200,000 Monitor locations with PRG for length determined by US EPA
2 Reporting		yr	30	\$12,000	\$360,000 Post-Closure Reporting
3 O&M		yr	30	\$10,000	\$300,000
					\$1,860,000
Present wo	th @ 7% discount factor				\$715,090

GRAND TOTAL: \$51,613,748

Cost +

Total Capital Cost With Contingency \$ 50,898,658

		0	versight &		
Summary	Cost	Е	ngineering	Co	ntingency
Mob/demob & Misc	\$ 1,844,710	\$	2,398,124	\$	368,942
Dredge	\$ 17,584,105	\$	22,859,337	\$	3,516,821
Transport and Disposal	\$ 4,436,108	\$	5,766,941	\$	887,222
Water Treatment	\$ 10,067,515	\$	13,087,769	\$	2,013,503
Total Estimated Cost	\$ 33,932,439	\$	44,112,171	\$	6,786,488

Based upon GIS calculations
Based upon GIS calculations
Assume large wood waste is 20% of total sediments
(Weight estimate based on SG = 2.6 dry weight, 65%solids for disposal)
(Water volume estimate based on 46% solid content by volume)

Total Area:

Total Sediment Volume: Total Volume of Large Wood Waste: Total Sediment Weight: Total Volume of Water: 696,960 sq ft 133,906 cy

26,781 cy 58,500 tons 121 Mgal

Mob/Demob			,	
Mob/Demob	<u>Unit</u> Is	Quamtity 1	Unit Costs \$1,916,784	Total Notes \$1,916,784 Approx 5% total cost
Mechanical Dredging & Sediment Treatment				
Item No. Item	<u>Unit</u>	Quamtity	Unit Costs	Total Notes
1 Survey	ea	2	\$37,500	\$75,000 Pre- and Post- Bathymetric Survey
2 Move/Abandon Existing Utilities	ls	1	\$100,000	\$100,000
3 24 hr. Security of Site	weekly	90	\$2,695	\$242,550 \$15/hr X 24 hr X 7 days + \$25/day (expenses)
4 Perimeter Fence	In ft	2528	\$20	\$50,560 Fence along land side
5 Install Sheet pile outside dredge area	sq ft	45000	\$48	\$2,160,000 Install sheet pile wall instead of silt curtains
6 Install HC Boom	ft	5460	\$4	\$21,840 Install HC Boom on both sides of the wall in water pre-wall installation activities on both sides of sheetpile & 200 ft on each shore
7 HC Boom Debris Disposal Labor	ea	2	\$3,000	\$6,000 Remove debris twice during dredging using a barge
8 Debris Disposal	ea	2	\$1,500	\$3,000 Dispose of debris in 20 cy. roll off box
9 HC Boom Removal	ft	5460	\$4	\$21,840 Removal of HC Boom into roll off box
10 Dispose of Boom	ea	2	\$1,500	\$3,000 Dispose of HC Boom in two 20 cy. roll off boxes
11 Large Wood Waste Removal	cy	26781	\$45	\$1,205,150 Assume removal of large debris will take 20% of the total at 1.5 times the dredge rate or 45/cy
12 Screening	day	179	\$2,500	\$446,352 Screening system to separate wood from sediments
13 Large Wood Waste Disposal	ea	1339	\$1,500	\$2,008,583 Dispose of large debris in a 20 cy. roll off box. Assume 20% is large waste = (26,781 cy)/20 cy/box
14 Dredge Sediment	cy	107124	\$30	\$3,213,733 Mechanically dredge sediments with a concentration greater than 10 ppm (Includes transport to land cost). Assume MD 200 cy/day of (133,096 - 26,781 cy) affected sediment
15 Air Emissions Monitoring	weeks	90	\$8,725	\$785,250 Monitor air quality during construction and dredging based on 5 stations 3 times/week using NIOSH methods
16 Water Quality Monitoring	weeks	76	\$9,000	\$684,000 Daily Water Quality Monitoring through dredging process (including time to remove large wood waste)
17 Dewatering - Filterpress	cy	107124 38519	\$35 \$25	\$3,749,355 Total dredged minus wood, rate based on bids
18 cap shoreline slope 19 Install Rip-Rap Shore Protection	cy ton	1360	\$25 \$40	\$962,975 4'x100'x1500' plus 0.5 ft cap in dredge area \$54,400 ~2600 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1360 tons @ 130 pcf
20 Benthic Habitat/Thin layer	CV	12907	\$40 \$18	\$34,400 = Zoou in a similine inside zeroun, air wine, in trinke, injerialy = 20,000 on in priap = 1360 ons @ 130 pci \$332,320 Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area.
20 Dentilio Habitati Hill Tayer	Су	12307	Subtotal	SECURITY OF THE FIRST HIM SECURITY CHARACTERS TO CHECKE ALEX.
Thermal Treatment	<u>Unit</u>	Quamtity	Unit Costs	<u>Total</u> <u>Notes</u>
Thermal Trearment	ton	90018	\$100	\$9,001,792 Bid of \$80/ton plus misc items \$20/ton = \$100/ton
Transport & Disposal				
Item No.	<u>Unit</u>	Quamtity	Unit Costs	Total Notes
1 Load 2 Haul to landfill	day ton	80 64350	\$1,440 \$27	\$115,830 40 trucks/day X 20 tons/truck = 800 tons/day \$1,737,450 Sediment weight plus 10% wetting - Truck all sediment to Seven Mile LF - Eau Claire
3 Disposal	ton	64350	\$27 \$18	\$1,75,800 Tipping Fee
о Біорозаі	ton	04000	Subtotal	\$3,011,581
Water Transferred				
Water Treatment:				
Item No. Item	<u>Unit</u>	Quamtity	Unit Costs	Total Notes
1 Pond and Sand Filter Capital Cost	ea	1	\$852,682	\$852,682
2 Oil Water Separator	ea	2	\$25,000	\$50,000
Oil Water Separator O&M     Carbon Filtration	Mgal Mgal	121 121	\$2,700 \$67,000	\$327,158 \$8,118,370 Stryker Bay Cost Estimates (See CDF cost Sheet)
5 Water Quality Testing	Mgal	121	\$2,400	50, 110,370 Suyker Bay Cost Estillates (See CDF Cost Sheet) \$290,807
6 O&M	day	179	\$2,400	\$29,007 \$428,498
o daw	day	175	Subtotal	\$10,067,515
Misc:				
Item No. Item  1 Develop HASP	<u>Unit</u> Is	Quamtity 1	Unit Costs \$10,000	Total Notes \$10,000 \$100/hr X 40 hr/wk X 2.5 weeks
2 Health & Safety Personnel	week	152	\$1,440	\$10,000 \$10,001 A 011MK A 2.5 Weeks \$218,880 Once a week, for duration of project
2 Health & Salety Fersonnel	week	132	Subtotal	\$228,880
			Total:	\$40,252,459
		E	ngineering @ 15%:	\$6,037,869
		_	Oversight @ 15%:	\$6,037,869
			Subtotal:	\$52,328,197
		C	ontingency @ 20%:	\$8,050,492 Only taken on Capital Costs not Engineering
			TOTAL ·	\$60.378.689

TOTAL: \$60,378,689

Item No.	<u>ltem</u>	Unit	Quamtity	Unit Costs	Total	<u>Notes</u>
1 Monitoring	l	yr	30	\$40,000.00	\$1,200,000	Monitor locations with PRG for length determined by US EPA
2 Reporting		yr	30	\$12,000.00	\$360,000	Post-Closure Reporting
3 O&M		yr	30	\$10,000.00	\$300,000	
				Subtotal	\$1,860,000	
Present w	orth @ 7% discount factor				\$715.090	

GRAND TOTAL: \$61,093,779

		<u>c</u>	Cost + Oversight &		
Summary	Cost	E	ngineering	Co	ntingency
Mob/demob & Misc	\$ 2,145,664	\$	2,789,363	\$	429,133
Dredge	\$ 16,025,908	\$	20,833,681	\$	3,205,182
Thermal Treatment	\$ 9,001,792	\$	11,702,329	\$	1,800,358
Transport and Disposal	\$ 3,011,581	\$	3,915,055	\$	602,316
Water Treatment	\$ 10,067,515	\$	13,087,769	\$	2,013,503
Total Estimated Cost	\$ 40,252,459	\$	52,328,197	\$	8,050,492

Total Capital Cost With Contingency \$ 60,378,689

Total Area: 696.960 Total Wet Sediment Volume: 133,906 Total Dry Sediment Weight: Estimated Volume of Water to be Treated:

sa ft cu yd 58.500 tons Mgal

180

Based upon GIS calculations

Includes volume of water in sediments (Weight estimate based on SG = 2.6 dry weight, 75% volume reduction)

Mobilization/Demobilization

Unit Quamtity Unit Costs Item No. Item Total Notes 1 Mob/Demob \$2,054,744 \$2,054,744 Approx 5% total cost

> Subtotal, Mobilization/Demobilization \$2,054,744

> > 1640

\$20

Subtotal

Sediment Removal and Treatment

9 Silt Fence

<u>Item</u>	Unit	Quamtity	Unit Cost	Total
	lf	1680	\$20	\$33,600
Survey	ea	2	\$37,500	\$75,000
sed Landward Sheet Pile Alignment	day	15	\$1,800	\$27,000
eatures	Is	1	\$100,000	\$100,000
tilities	Is	1	\$100,000	\$100,000
			Subtotal	\$335,600
ile System at 2900N, Wave Attenuator				
<u>Item</u>	Unit	Quamtity	Unit Cost	Total
Wave® Floating Wave Attenuator	Is	1	5029950	\$5,029,950
	If	1770	\$4	\$7,080
System in Bay	sec	184	\$24,880	\$4,583,158
	sf	49920	\$62	\$3,095,040
	sf	21615	\$62	\$1,340,130
	Survey ed Landward Sheet Pile Alignment eatures ilities ile System at 2900N, Wave Attenuator	Survey ea de de la day eatures la silities	Survey	Survey

Notes Fence along land side where there is no sheet pile wall (with 20 ft overlap), back to the railroad tracks

2680 Ift at appx 200 Ift per day

Includes installation of electric upon completion (\$40k) & move/abandon existing utilities (\$60k)

Containn	nent with Pipe and Sheet Pile System at 2900N, Wave Attenuator				
Item No	. Item	Unit	Quamtity	Unit Cost	Total
	1 2,200 linear feet of WhisprWave® Floating Wave Attenuator	Is	1	5029950	\$5,029,950
	2 Install HC Boom in Lake	If	1770	\$4	\$7,080
	3 Pipe / AZ Combined Wall System in Bay	sec	184	\$24,880	\$4,583,158
	4 West Sheetpiling	sf	49920	\$62	\$3,095,040
	5 East Sheetpiling	sf	21615	\$62	\$1,340,130
	6 South Sheetpiling	sf	31455	\$62	\$1,950,210
	7 Remove HC Boom from Lake	If	1770	\$4	\$7,080
	8 Dienosa HC Room	- 02	3	\$1.500	\$4.500

Notes

Purchase, ship, and install wave attenuator device

Install HC Boom on one side of piling and extend to shorelines PA36/13 pipe/sht piling;(Pipe)14.2.7 lb/ft x 61 ft + (sheeting)22.02 lb/ft2 x 231 ft2 = 13800 lbs @ \$0.80/lb = \$11,040 + \$1400 (seal) = \$12,4 Length,ft: 1400

Includes \$56 sq/ft for PZ35 piling (35lbs/sq ft @ \$0.80/lb + \$28 for in: Length,ft: 960 Includes \$56 sq/ft for PZ35 piling (35lbs/sq ft @ \$0.80/lb + \$28 for in: Length,ft: 655 Includes \$56 sq/ft for PZ35 piling (35lbs/sq ft @ \$0.80/lb + \$28 for in: Length,ft: 1165

Remove HC Boom on one side of piling and extend to shorelines

Dispose of HC Boom in 20 cy. roll off boxes

Along south, east, and west sides of Kreher Park, back to the railroad track, beyond the sheetpile wall

Sediment Drainage Pad Item No. Unit Quamtity Unit Costs Total \$187,650 Asphalt Drainage Pad Construction sq yd 4170 \$45 \$300 2 Pumping excess/drained water to WWTP 670 \$201,000 Subtota \$388 650

Notes

\$32,800

\$16,049,948

\$27,570,933

Notes 150 ft x 250 ft = 37,500 sq ft = 4,170 sq yd

Sediment Removal Item No. Item Unit Quamtity **Unit Costs** Total Cutoff and Remove Old Pilings ea \$500 \$20,000 \$150,000 \$1,350,000 2 Remove Existing Shoreline Riprap 7500 \$20 3 Crane w/ dragline day day day day ea 300 \$4,500 4 Dozers (2) 300 \$3,600 \$1,080,000 5 Excavators (2) 300 150 \$3,600 \$1,080,000 6 Conveyors (4) \$300,000 \$2,000 7 Confirmation Samples 8 Air Emissions Monitoring weeks 60 \$8 725 \$523 500 9 Temporary Barriers 100 \$1,500 \$150,000 ea

58,500 tons dry sediments x 50% increase to account for moisture in the sediments = 87,750 tons, assumes ~300 tons are removed per day

2 Dozers at \$1800 per day per dozer

2 Excavators at \$1800 per day per excavator 4 Conveyors at \$500 per day per conveyor

Monitor air quality during sediment removal based on 5 stations 3 times/week using NIOSH methods

Jersey barriers to provide separation of areas

\$4,733,500 Waste Separation/Stabilization Unit Quamtity **Unit Costs** Total \$540,000 Remove Large Wood/Debris Waste day ea 300 \$1,800 2 Dispose Large Wood/Debris Waste at 20 cu yd per roll-off box 1340 \$1,500 \$2,010,000 \$4,000 \$2,244,340 3 Waste Sampling for Landfilling \$400 4 Mixing Reagent for Stabilization 64124 cu vd \$35 5 Flexible Hose/Pipe for Reagent 1520 Subtota \$4,813,540

Load at \$1800/day for period of ~300 days of sediment processing
Dispose of large debris as special waste in a 20 cy. roll off box. Assume 20% is large waste = (26,781 cy)/20 cy/box = 1,340 boxes

Reagent and mixing costs combined; assume 2/3 of remaining sediments needs to be stabilized (87750 tons / 1.5 tons/cu yd = 58500 cu yd \* 2/3 = 39,000 cu yd) To get reagent to the mixing area/s within the drained Bay

Shoreline Restoration <u>Item</u>
1 Place 0.5 ft Clean Sand in Bay + 30,000 cu yds Near Shore Unit Quamtity 38519 **Unit Costs** Total \$962,975 cu vd 2 Install Rip-Rap Shore Protection 1360 \$54,400 ton 3 Benthic Habitat/Thin laver 12907 \$18 \$232,320 Subtota \$1,249,695

~2500 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1300 tons @ 130 pcf

Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area.

Subtotal, Sediment Removal and Treatment

## Water Removal and Treatment

Ground Water Capture System Upgradient of Containment Wall					
Item No. Item	Unit	Quamtity	Unit Cost	Total	Notes
1 Trench Excavation	If	1165	\$50	\$58,250	18 ft deep by 3 ft wide
2 Contaminated Soil Disposal	tons	3495	\$60	\$209,700	Dispose as special waste at \$60/ton; Assumes 1.5 tons/cu yd
3 Trench Filter Fabric	sf	48930	\$1	\$48,930	Fabric along both sides and the bottom of the trench, and between the gravel backfill and the overlying soil backfill material
4 Gravel Backfill	tons	2718	\$20	\$54,367	From 4 ft to ~18 ft bgs, 3 ft wide; 1.5 tons/cu yd
5 Collection Pipe, 4-in HDPE Perforated	lf	1245	\$30	\$37,350	1165 ft of pipe in trench, 4 - 20 ft segments from the sumps to the header
6 Trenching, Backfill, and Compaction	cu yd	518	\$20	\$10,356	Soil material above the gravel in the trench; from 0 to 4 ft bgs; 1.5 tons/cu yd
7 Discharge Piping, 6-in HDPE	lf	1335	\$38	\$50,730	1165 ft of header pipe placed on ground surface, 170 ft from header pipe to WWTP
8 Connection to Sanitary Pump Station	ea	1	\$2,000 \$200	\$2,000	
9 Water Samples	ea	100 4		\$20,000	
10 Collection Sump	ea		\$2,000	\$8,000	
11 Sump Pump	ea	4	\$4,500 \$2,500	\$18,000 \$10,000	
12 Sump Level Controls 13 Electrical Conduit	ea If	1245	\$2,500	\$10,000	1065 ft of conduit pipe placed on ground surface, and 4 - 20 ft segments from the sumps to the header
14 Misc. Electrical	ls	1245	\$10,000	\$12,450	1005 it of conduit pipe placed on ground surface, and 4 - 20 it segments from the sumps to the header
15 Grout Ground Water Treatment System Trench at end of Project	cu yd	820	\$10,000	\$20,500	18 ft deep, 3 ft wide, 1165 lf; assumes 35% void space
13 Glour Glound Water Freatment System Henor at end of Froject	cu yu	020	Subtotal	\$570,632	10 ft deep, 3 ft wide, 1100 ii, assumes 30% void space
			Gubiotai	\$570,03 <u>2</u>	
Lake Water Removal System Inside of Containment					
Item No. Item	Unit	Quamtity	Unit Cost	Total	Notes
1 2 Pumps at 500 gpm w/ Operator to Initially Drain Bay	day	50	\$7,840	\$392,000	\$85/hr x 8 hrs + 127.50/hr x 16 hr + \$1200/day pump] x 2; ~60,000,000 gal in Bay; 2 - 500gpm pumps = 1,440,000 gpd; added 8 add'l days for rain, gw, and lake water infiltration
2 Sump pumps variable discharge 10 to 100 gpm	ea	8	\$4,500	\$36,000	Dewater sediments
3 Collection/discharge piping, 12-in HDPE	If	3280	\$5.50	\$18,040	Two collection pipes runs on land along Bay from the NW and NE corners of the Bay until reaching WWTP; Discharge pipe runs to the east to Lake Superior (east of the containment area)
4 Connection to WWTP	ea	3	\$2,000	\$6,000	Two intake connections from each side of the Bay (West and East), one outgoing connection for treated water going to Lake Superior
5 Start-up Samples	ea	200	\$200	\$40,000	
6 Electrical Conduit	If	1450	\$10	\$14,500	Runs on land along Bay to the west and east, connects up with the Ground Water Capture System conduit to the south
7 Connection to City Power Supply	Is	1	\$20,000	\$20,000	Connection and transformer
8 1 500 gpm Pump w/ Operator to Drain Bay 4 weeks each Spring	day	84	\$3,920	\$329,280	[\$85/hr x 8 hrs + 127.50/hr x 16 hr + \$1200/day pump] x 1; Assumes there will be 3 unworked winters between 4 working seasons
			Subtotal	\$855,820	
0					
Ground/Lake Water Treatment System					
Item No. Item	Unit	Quamtity	Unit Cost	Total	Notes
Year 2 Startup					Start-up is for approximately 50 days in Year 2 and 28 days in subsequent years 3 and 4.
Carbon Adsorber System (1500 gpm)			040.005	600.070	Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
1 Rental Initiation: mobilization, set-up, carbon 2 Rental*	ea Months	2	\$49,335	\$98,670	"There is a three month minimum rental for each of the two units
		6	\$5,000	\$30,000	I nere is a three month minimum rental for each of the two units
3 Rental Termination: carbon removal, demobilization	ea	2	\$41,935	\$83,870	
4 Oil Water Separator and associated system (200 gpm) (purchase)	ea	2	\$30,000 \$10.490	\$30,000 \$20,980	
5 Fuel and energy surcharge (estimated 8.65%)		1			
<ul><li>6 Connecting piping, pumps, accessories</li><li>7 Operation and Maintenance (labor)</li></ul>	ea hours	900	\$20,000 \$100	\$20,000 \$90,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal	Hours	300	\$100	\$373,520	Two employees for 30 flours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 florities per year for 4 years.
Year 2 During and After Startup				φ3/3,020	
Carbon Adsorption System and Bag System for Filtration (200 gpm)	1				Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
1 Rental Initiation: mobilization, set-up, carbon	ea	1	\$28.675	\$28.675	Accounts defined careful of the water careful and a desirable and a desirable careful and a desirable and a de
2 Rental**	Months	6	\$1,500	\$9,000	**Six months for each units plus the first month that comes with the rental for a total of seven months use-time.
3 Rental Termination:carbon removal,system disassembly,demob	ea	1	\$39.350	\$39,350	OIX INCIDENTAL COLOR CONTROL INCIDENTAL CONTROL CONTROL COLOR COLO
4 Carbon Exchange Rate	gallons	30000000	\$0.067	\$2.010.000	
5 BF400 Four Bag Filter Skid	Months	7	\$4,000	\$28,000	
6 Filter Bags (5 micron rating) - Bag of 50	Cases	8	\$600	\$4,800	
7 Fuel and energy surcharge (estimated 8.65%)	ea	1	\$183,365	\$183,365	
8 Dispose soil in filter bags (special waste)	tons	17	\$60	\$1,020	All filter bags will fill with fines and have to be disposed as special waste. Assumed average cost is \$60/ton.
9 Oil Disposal	gallons	200	\$3	\$600	Oil from oil/water separator will be collected in a 55 gallon drum and disposed as necessary.
10 Operation and Maintenance (labor)	hours	2150	\$100	\$215,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal				\$2,519,810	
Year 3, 4 Startup					Start-up is for approximately 50 days in Year 2 and 28 days in subsequent years 3 and 4.
Carbon Adsorber System (1500 gpm)					Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
<ol> <li>Rental Initiation: mobilization, set-up, carbon</li> </ol>	ea	4	\$49,335	\$197,340	
2 Monthly rental*	Months	12	\$5,000	\$60,000	*There is a three month minimum rental for each of the two units
3 Rental Termination: carbon removal, demobilization	ea	4	\$41,935	\$167,740	
4 Fuel and energy surcharge (estimated at 8.65%)	ea	2	\$18,385	\$36,769	
5 Operation and Maintenance (labor)	hours	1200	\$100	\$120,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal  Voor 3 4 During and After Startup				\$581,849	
Year 3, 4 During and After Startup					Assumes activated and as of late waters of fision to discharge water had into Late Council.
Carbon Adsorption System and Bag System for Filtration (200 gpm)  1 Rental Initiation: mobilization, set-up, carbon	ea	2	\$28,675	\$57,350	Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
2 Monthly rental**	Months	12	\$1,500	\$18,000	**Six months for each units plus the first month that comes with the rental for a total of seven months use-time.
3 Rental Termination:carbon removal,system disassembly,demob		2	\$39.350	\$78,700	Six months for each units plus the first month that comes with the rental for a total of seven months use-time.
4 Carbon Exchange Rate	gallons	30000000	\$0.067	\$2,010,000	
5 BF400 Four Bag Filter Skid	Months	14	\$4,000	\$56,000	
6 Filter Bags (5 micron rating) - Bag of 50	Cases	16	\$600	\$9,600	
7 Fuel and energy surcharge (estimated 8.65%)	ea	2	\$96,432	\$192,865	
8 Dispose soil in filter bags (special waste)	tons	34	\$60	\$2,040	All filter bags will fill with fines and have to be disposed as special waste. Assumed average cost is \$60/ton.
9 Oil Disposal	gallons	600	\$3	\$1,800	All files bags with in with times and lates to be disposed as special waste. Assumed average cost is sporton.  Oil from oil/water separator will be collected in a 55 gallon drum and disposed as necessary.
10 Operation and Maintenance (labor)	hours	4900	\$100	\$490,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal			T	\$2,916,355	
			Subtotal	\$6,391,534	Total for 3 years
Subtotal.	Water R	emoval and	d Treatment	\$7,817,986	

Item No.  1 Load, 2 Haul to Landfill 3 Disposal of NAPL offsite 4 Disposal of NAPL offsite 5 Cut Perimeter Sheet Pile Wa 6 Remove Asphalt Drainage Pi		Unit ton ton ton gal sf sq yd	Quamtity 124 99020 99020 5000 10720 4170	Unit Costs \$1,440.00 \$27.00 \$18.00 \$8 \$25 \$10	Total \$178,560 \$2,673,540 \$1,782,360 \$40,000 \$268,000 \$41,700 \$4,984,160	Notes One-third of total weight wet (87750 / 3) = 29250 tons Assumes 20% weight increase for stabilized waste = 39000 cu yd x 1.2 = 46800 cu yd * 1.5 tons/cu yd = 70200 tons Same units used in 1998 cost Three sides of site; 4 ft x 2680 lf = 10,720 sq ft
Miscellaneous Item No.  1 Develop HASP 2 Health & Safety Personnel 3 24 hr Security of Site	<u>Item</u>	Unit Is wk wk	Engin Ove	Unit Costs \$10,000 \$1,440 \$2,695 scellaneous Subtotal: eering @ 15%: orsight @ 15%: Subtotal: gency @ 25%: TOTAL:	Total \$10,000 \$172,800 \$539,000 \$721,800 \$43,149,623 \$6,472,443 \$6,472,443 \$56,094,510 \$10,787,406 \$66,881,915	Notes  Once a week for duration of project; 3.8 years of work * 52 wks / yr * 7/12 (working 7 months of the year) \$15/hr X 24 hr X 7 days + \$25/day (expenses); 3.8 years of work * 52 wks / yr
Post-Construction Item No.  1 Monitoring 2 Reporting 3 O&M  Present worth @ 7% discoun	<u>Item</u> ot factor	Unit yr yr yr yr		Unit Costs \$40,000 \$12,000 \$10,000 -Construction	Total \$1,200,000 \$360,000 \$300,000 \$1,860,000 \$715,090 \$67,597,005	Notes Monitor locations with PRG for length determined by US EPA Post-Closure Reporting

Based upon GIS calculations

Total Wet Sediment Volume: 133,906 cu vd Includes volume of water in sediments Total Dry Sediment Weight: 58.500 (Weight estimate based on SG = 2.6 dry weight, 75% volume reduction) tons Estimated Volume of Water to be Treated: 180 Mgal Mobilization/Demobilization Item No. 1 Mob/Demob Item Quamtity Unit Costs Total \$2,497,981 Notes Approx 5% total cost \$2,497,981 Subtotal, Mobilization/Demobilization \$2,497,981 Sediment Removal Pre-Construction Activities Item No. Unit Quamtity **Unit Cost** Total Item . 1 Perimeter Fence 1680 \$33,600 Fence along land side where there is no sheet pile wall (with 20 ft overlap), back to the railroad tracks 2 Pre- and Post-Bathymetric Survey \$37,500 \$75,000 2680 lft at appx 200 lft per day 3 Pretrenching along Proposed Landward Sheet Pile Alignment day 15 \$1.800 \$27,000 4 Removal of Existing Site Features \$100,000 \$100,000 5 Move/Abandon Existing Utilities \$100,000 Includes installation of electric upon completion (\$40k) & move/abandon existing utilities (\$60k) \$100,000 Subtotal \$335,600 Containment with Pipe and Sheet Pile System at 2900N, Wave Attenuator Quamtity Unit Cost Total 1 2,200 linear feet of WhisprWave® Floating Wave Attenuator \$5.029.950 Purchase, ship, and install wave attenuator device Install HC Boom on one side of piling and extend to shorelines 5029950 2 Install HC Boom in Lake 1770 \$4 \$7.080 3 Pipe / AZ Combined Wall System in Bay \$24,880 \$4,583,158 PA36/13 pipe/sht piling;(Pipe)142.7 lb/ft x 61 ft + (sheeting)22.02 lb/ft2 x 231 ft2 = 13800 lbs @ \$0.80/lb = \$11,040 + \$1400 (seal) = \$12, Length,ft: 1400 sec 184 4 West Sheetpiling 49920 \$3,095,040 Includes \$56 sq/ft for PZ35 piling (35lbs/sq ft @ \$0.80/lb + \$28 for in Length,ft: 960 5 East Sheetpiling 21615 \$62 \$1,340,130 Includes \$56 sq/ft for PZ35 piling (35lbs/sq ft @ \$0.80/lb + \$28 for in Length,ft: 655 6 South Sheetpiling 31455 \$62 \$1,950,210 Includes \$56 sq/ft for PZ35 piling (35lbs/sq ft @ \$0.80/lb + \$28 for in Length,ft: 1165 7 Remove HC Boom from Lake 1770 \$4 \$7,080 Remove HC Boom on one side of piling and extend to shorelines 8 Disnose HC Boom ea \$1.500 \$4,500 Dispose of HC Boom in 20 cv. roll off boxes Along south, east, and west sides of Kreher Park, back to the railroad track, beyond the sheetpile wall 9 Silt Fence 1640 \$20 \$32,800 Subtotal \$16,049,948 Sediment Drainage Pad Item No. Item Unit Quamtity **Unit Costs** Total Notes 150 ft x 250 ft = 37,500 sq ft = 4,170 sq yd Asphalt Drainage Pad Construction \$187.650 sq yd 4170 2 Pumping excess/drained water to WWTP day 670 \$300 \$201.000 Subtotal \$388,650 Sediment Removal Item No. Unit Quamtity **Unit Costs** Total Notes Item Cutoff and Remove Old Pilings \$20,000 2 Remove Existing Shoreline Riprap ton 7500 \$20 \$150,000 58,500 tons dry sediments x 50% increase to account for moisture in the sediments = 87,750 tons, assumes ~300 tons are removed per day 3 Crane w/ dragline day 300 \$4 500 \$1,350,000 \$1,080,000 2 Dozers at \$1800 per day per dozer \$3,600 4 Dozers (2) day 300 5 Excavators (2) day 300 \$3,600 \$1,080,000 2 Excavators at \$1800 per day per excavator 6 Conveyors (4) day 150 \$2,000 \$300,000 4 Conveyors at \$500 per day per conveyor 7 Confirmation Samples 400 \$200 \$80,000 8 Air Emissions Monitoring weeks 60 \$8.725 \$523,500 Monitor air quality during sediment removal based on 5 stations 3 times/week using NIOSH methods 9 Temporary Barriers ea 100 \$1,500 \$150,000 Jersey barriers to provide separation of areas 10 Remove Large Wood/Debris Waste \$540,000 Load at \$1800/day for period of ~300 days of sediment processing \$1,800 dav 300 11 Dispose Large Wood/Debris Waste at 20 cu vd per roll-off box 1340 \$1,500 \$2,010,000 Dispose of large debris as special waste in a 20 cy. roll off box. Assume 20% is large waste = (26,781 cy)/20 cy/box = 1,340 boxes Subtotal \$7,283,500 Sediment Dewatering Item No. Unit **Unit Costs** Total \$3,749,368 Item Dewatering - Filterpress 107125 Total dredged minus wood, rate based on bids Subtotal \$3,749,368 Shoreline Restoration Item No. Unit Unit Costs Quamtity Total cap shoreline slope 38519 \$962,975 Area of Bay ~912,600 sq ft; 912600 ft2 x 0.5 ft / 27 yd3/ft3 = 16,900 cu yd + 30,000 cu yd = 46,900 cu yd cu yd 2 Install Rip-Rap Shore Protection 1360 \$40 \$54,400 ~2500 If of shorline inside 2900N, 8ft wide, 1 ft thick rip-rap = 20,800 cu ft of rip-rap = 1300 tons @ 130 pcf Apply 0.5 ft of fish mix @ \$18/cy (Stryker Bay estimates) to dredge area. 3 Renthic Habitat/Thin laver cv 12907 \$18 \$232 320 \$1 249 695 Subtotal Subtotal, Sediment Removal \$29,056,761 Water Removal and Treatment Ground Water Capture System Upgradient of Containment Wall

Total Area:

Quamtity

1165

3495

tons

1 Trench Excavation

2 Contaminated Soil Disposal

**Unit Cost** 

\$50

\$60

Total

18 ft deep by 3 ft wide

Dispose as special waste at \$60/ton; Assumes 1.5 tons/cu yd

\$58,250

\$209 700

696.960 sa ft

3 Trench Filter Fabric	sf	48930	\$1	\$48,930	Fabric along both sides and the bottom of the trench, and between the gravel backfill and the overlying soil backfill material
4 Gravel Backfill	tons	2718	\$20	\$54,367	From 4 ft to –18 ft bgs, 3 ft wide; 1.5 tons/cu yd
5 Collection Pipe, 4-in HDPE Perforated 6 Trenching, Backfill, and Compaction	If cu vd	1245 518	\$30 \$20	\$37,350 \$10,356	1165 ft of pipe in trench, 4 - 20 ft segments from the sumps to the header Soil material above the gravel in the trench; from 0 to 4 ft bgs; 1.5 tons/cu yd
7 Discharge Piping, 6-in HDPE	lf	1335	\$38	\$50,730	1165 ft of header pipe placed on ground surface, 170 ft from header pipe to WWTP
8 Connection to Sanitary Pump Station	ea	1	\$2,000	\$2,000	
9 Water Samples	ea	100	\$200	\$20,000	
10 Collection Sump 11 Sump Pump	ea ea	4	\$2,000 \$4,500	\$8,000 \$18,000	
12 Sump Level Controls	ea	4	\$2,500	\$10,000	
13 Electrical Conduit	If	1245	\$10	\$12,450	1065 ft of conduit pipe placed on ground surface, and 4 - 20 ft segments from the sumps to the header
14 Misc. Electrical	ls	1	\$10,000	\$10,000	
15 Grout Ground Water Treatment System Trench at end of Projec	cu yd	820	\$25 Subtotal	\$20,500 <b>\$570,632</b>	18 ft deep, 3 ft wide, 1165 lf; assumes 35% void space
Lake Water Removal System Inside of Containment					
Item No. Item	Unit	Quamtity	Unit Cost	<u>Total</u>	Notes
1 2 Pumps at 500 gpm w/ Operator to Initially Drain Bay	day	50	\$7,840	\$392,000	[\$85/hr x 8 hrs + 127.50/hr x 16 hr + \$1200/day pump] x 2; ~60,000,000 gal in Bay; 2 - 500gpm pumps = 1,440,000 gpd; added 8 add'l days for rain, gw, and lake water infiltration
2 Sump pumps variable discharge 10 to 100 gpm	ea	8	\$4,500	\$36,000	Dewater sediments
Collection/discharge piping, 12-in HDPE     Connection to WWTP	If ea	3280 3	\$5.50 \$2,000	\$18,040 \$6,000	Two collection pipes runs on land along Bay from the NW and NE corners of the Bay until reaching WWTP; Discharge pipe runs to the east to Lake Superior (east of the containment a Two intake connections from each side of the Bay (West and East), one outgoing connection for treated water going to Lake Superior
5 Start-up Samples	ea	200	\$200	\$40,000	Two make connections from cash side of the Bay (west and East), one deligning connection for acade water going to Eake Superior
6 Electrical Conduit	If	1450	\$10	\$14,500	Runs on land along Bay to the west and east, connects up with the Ground Water Capture System conduit to the south
7 Connection to City Power Supply	ls	1	\$20,000	\$20,000	Connection and transformer
8 1 500 gpm Pump w/ Operator to Drain Bay 4 weeks each Sprinç	day	84	\$3,920 Subtotal	\$329,280 <b>\$855,820</b>	[\$85/hr x 8 hrs + 127.50/hr x 16 hr + \$1200/day pump] x 1; Assumes there will be 3 unworked winters between 4 working seasons
			Gubiotai	\$000,020	
Ground/Lake Water Treatment System Item No. Item	Unit	Quamtity	Unit Cost	Total	Notice
Year 2 Startup	Unit	Quamtity	Unit Cost	<u>Total</u>	Notes Start-up is for approximately 50 days in Year 2 and 28 days in subsequent years 3 and 4.
Carbon Adsorber System (1500 gpm)					Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
1 Rental Initiation: mobilization, set-up, carbon	ea	2	\$49,335	\$98,670	•
2 Rental*	Months	6	\$5,000	\$30,000	*There is a three month minimum rental for each of the two units
<ol> <li>Rental Termination: carbon removal, demobilization</li> <li>Oil Water Separator and associated system (200 gpm) (purchas</li> </ol>	ea ea	2	\$41,935 \$30.000	\$83,870 \$30,000	
5 Fuel and energy surcharge (estimated 8.65%)	ea	2	\$10.490	\$20,980	
6 Connecting piping, pumps, accessories	ea	1	\$20,000	\$20,000	
7 Operation and Maintenance (labor)	hours	900	\$100	\$90,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal				\$373,520	
Year 2 During and After Startup Carbon Adsorption System and Bag System for Filtration (200 g)	nm)				Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
1 Rental Initiation: mobilization, set-up, carbon	ea	1	\$28.675	\$28.675	Assumes deal-rated carbon of lake water summer to discharge water back into Eake Coperior
2 Rental**	Months	6	\$1,500	\$9,000	**Six months for each units plus the first month that comes with the rental for a total of seven months use-time.
3 Rental Termination:carbon removal,system disassembly,demob		1	\$39,350	\$39,350	
4 Carbon Exchange Rate 5 BF400 Four Bag Filter Skid	gallons Months	30000000 7	\$0.067 \$4,000	\$2,010,000 \$28,000	
6 Filter Bags (5 micron rating) - Bag of 50	Cases	8	\$4,000	\$4,800	
7 Fuel and energy surcharge (estimated 8.65%)	ea	1	\$183,365	\$183,365	
8 Dispose soil in filter bags (special waste)	tons	17	\$60	\$1,020	All filter bags will fill with fines and have to be disposed as special waste. Assumed average cost is \$60/ton.
9 Oil Disposal	gallons		\$3	\$600	Oil from oil/water separator will be collected in a 55 gallon drum and disposed as necessary.
10 Operation and Maintenance (labor) Subtotal	hours	2150	\$100	\$215,000 <b>\$2,519,810</b>	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Year 3, 4 Startup				\$2,519,610	Start-up is for approximately 50 days in Year 2 and 28 days in subsequent years 3 and 4.
Carbon Adsorber System (1500 gpm)					Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
<ol> <li>Rental Initiation: mobilization, set-up, carbon</li> </ol>	ea	4	\$49,335	\$197,340	
2 Monthly rental*	Months	12	\$5,000	\$60,000	*There is a three month minimum rental for each of the two units
<ol> <li>Rental Termination: carbon removal, demobilization</li> <li>Fuel and energy surcharge (estimated at 8.65%)</li> </ol>	ea ea	4 2	\$41,935 \$18,385	\$167,740 \$36,769	
5 Operation and Maintenance (labor)	hours	1200	\$100	\$120,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal			****	\$581,849	
Year 3, 4 During and After Startup	,				
Carbon Adsorption System and Bag System for Filtration (200 gi 1 Rental Initiation: mobilization, set-up, carbon	pm) ea	2	\$28.675	\$57,350	Assumes activated carbon of lake water sufficient to discharge water back into Lake Superior
2 Monthly rental**	Months	12	\$1,500	\$18,000	**Six months for each units plus the first month that comes with the rental for a total of seven months use-time.
3 Rental Termination:carbon removal,system disassembly,der		2	\$39,350	\$78,700	Christian Constant and product in the former than the control of the constant and control in the control of the
4 Carbon Exchange Rate	gallons	30000000	\$0.067	\$2,010,000	
5 BF400 Four Bag Filter Skid	Months	14	\$4,000	\$56,000	
6 Filter Bags (5 micron rating) - Bag of 50 7 Fuel and energy surcharge (estimated 8.65%)	Cases	16 2	\$600 \$96,432	\$9,600 \$192,865	
8 Dispose soil in filter bags (special waste)	tons	34	\$96,432 \$60	\$192,865	All filter bags will fill with fines and have to be disposed as special waste. Assumed average cost is \$60/ton.
9 Oil Disposal	gallons	600	\$3	\$1,800	Oil from oil/water separator will be collected in a 55 gallon drum and disposed as necessary.
10 Operation and Maintenance (labor)	hours	4900	\$100	\$490,000	Two employees for 50 hours per week for operations and maintenance. Operations (including startup) are to be maintained for 7 months per year for 4 years.
Subtotal			Subtotal	\$2,916,355 <b>\$6.391.534</b>	Total for 3 years
				, , , . ,	Country of your
Subtotal, V	Vater Re	emoval and	Treatment	\$7,817,986	
The second Treatment	1114	O	Heli Cerel	Total	Notes
Thermal Treatment  1 Thermal Treatment	Unit ton	Quanitity 90018	Unit Cost \$100	<u>Total</u> \$9,001,800	Notes Bid of \$80/ton plus misc items \$20/ton = \$100/ton

	Subtotal, Thermal Treatment	\$9,001,800	
Sediment Transport and Disposal			
Item No.  1 Load, Transport, Dispose Sediments  2 Disposal of NAPL offsite  3 Cut Perimeter Sheet Pile Wall and Dispose of Piling  4 Remove Asphalt Drainage Pad and Dispose	Unit         Quamtity         Unit Costs           ton         64350         \$46.80           gal         5000         \$8           sf         10720         \$25           sq yd         4170         \$10	Total \$3,011,580 \$40,000 \$268,000 \$41,700	Notes S8,500 tons dry sediments x 10% increase to account for moisture remaining in the sediments = 64,350 tons Same units used in 1998 cost Three sides of site; 4 ft x 2680 lf = 10,720 sq ft
Subtotal, Se	diment Transport and Disposal	\$3,361,280	
Miscellaneous Item No. Item  1 Develop HASP 2 Health & Safety Personnel 3 24 hr Security of Site	Unit   Quamtity   Unit Costs   15   1   \$10,000	Total \$10,000 \$172,800 \$539,000 \$721,800 \$52,457,608 \$7,868,641 \$7,868,641 \$58,194,891 \$13,114,402 \$81,309,293	Notes  Once a week for duration of project; 3.8 years of work * 52 wks / yr * 7/12 (working 7 months of the year) \$15/hr X 24 hr X 7 days + \$25/day (expenses); 3.8 years of work * 52 wks / yr
Post-Construction Item No. Item  1 Monitoring 2 Reporting 3 O&M  Present worth @ 7% discount factor	Unit   Quamtity   Unit Costs	Total \$1,200,000 \$360,000 \$300,000 \$1,860,000 \$715,090 \$82,024,383	Notes Monitor locations with PRG for length determined by US EPA Post-Closure Reporting